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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/659,103 | 09/09/2003 | Henry A. Hill | 09712-333001 / Z-436 | 4329 |
| 26161 | 7590 | 12/15/2005 | EXAMINER | |
| FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022 | | | TURNER, SAMUEL A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2877 | |

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/659,103

Applicant(s)

HILL, HENRY A.

Examiner

Samuel A. Turner

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-61 is/are rejected.
- 7) ☒ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>12/15/03, 2/4/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings are objected to because hand drawn lines in figure 1 and informal numbers and legends in figures 1-7. Figures 3, and 5-7 must be labeled as prior art. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application.

Replacement Drawing Sheets

Drawing changes must be made by presenting replacement sheets which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments section, or remarks, section of the amendment paper. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). A replacement sheet must include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of the amended drawing(s) must not be labeled as "amended." If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and within the top margin.

Annotated Drawing Sheets

A marked-up copy of any amended drawing figure, including annotations indicating the changes made, may be submitted or required by the examiner. The annotated drawing sheet(s) must be clearly labeled as "Annotated Sheet" and must be presented in the amendment or remarks section that explains the change(s) to the drawings.

Timing of Corrections

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.85(a). Failure to take corrective action within the set period will result in ABANDONMENT of the application.

If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings MUST be filed within the THREE MONTH shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 53-61 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claims 53-55, and 61; are incomplete in that these claims contain a limitation to "monitoring the position... using the method of claim 1".

Claim 1 is only directed to "determining the location of an alignment mark" and does not include any method for monitoring position.

Claims 59 and 61 are rejected as "use claims" as they merely recite a use without any active, positive steps delimiting how this use is actually practiced.

2173.05(q) "Use" Claims

Attempts to claim a process without setting forth any steps involved in the process generally raises an issue of indefiniteness under 35 U.S.C. 112, second paragraph.

For example, a claim which read: "A process for using monoclonal antibodies of claim 4 to isolate and purify human fibroblast interferon." was held to be indefinite because it merely recites a use without any active, positive steps delimiting how this use is actually practiced. *Ex parte Erlich*, 3 USPQ2d 1011 (Bd. Pat. App. & Inter. 1986). Other decisions suggest that a more appropriate basis for this type of rejection is 35 U.S.C. 101. In *Ex parte Dunki*, 153 USPQ 678 (Bd. App. 1967), the Board held the following claim to be an improper definition of a process: "The use of a high carbon austenitic iron alloy having a proportion of free carbon as a vehicle brake part subject to stress by sliding friction." In *Clinical Products Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966), the district court held the following claim was definite, but that it was not a proper process claim under 35 U.S.C. 101: "The use of a sustained release therapeutic agent in the body of ephedrine absorbed upon polystyrene sulfonic acid." Although a claim should be interpreted in light of the specification disclosure, it is generally considered improper to read limitations contained in the specification into the claims. See *In re Prater*, 415 F.2d 1393, 162 USPQ 541 (CCPA 1969) and *In re Winkhaus*, 527 F.2d 637, 188 USPQ 129 (CCPA 1975), which discuss the premise that one cannot rely on the specification to impart limitations to the claim that are not recited in the claim.

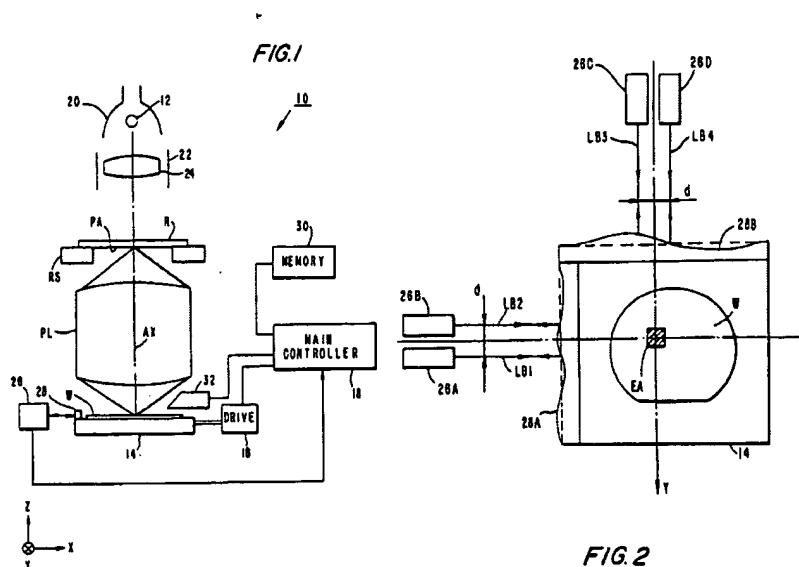
Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 10-12, 16-23, 25-27, 30, 36, 38, 39, 44-58, and 61 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kamiya(5,790,253).



With regard to claim 1, Kamiya teaches a method for determining the location of an alignment mark on a stage, the method comprising:

measuring a location, x_1 , of a stage along a first measurement axis using an interferometer(column 8, lines 40-47);

measuring a location, x_2 , of the stage along a second measurement axis substantially parallel to the first measurement axis(column 8, lines 40-47); and

determining a location of the alignment mark along a third axis substantially parallel to the first measurement axis based on x_1 , x_2 , and a correction term, ψ_3 , calculated from predetermined information comprising information characterizing imperfections in the interferometer(column 10, lines 37-51). Note that the imperfections in the interferometer are the measurement mirror curving errors.

As to claim 2, wherein x_1 and x_2 correspond to the location of the mirror at the first and second measurement axes, respectively(column 8, lines 40-47).

As to claim 3, wherein x_2 is measured using a second interferometer(column 8, lines 40-47).

As to claim 4, wherein the predetermined information comprises information characterizing imperfections in the second interferometer(column 8, lines 40-47).

Note that the imperfections in the interferometer are the measurement mirror curving errors.

As to claim 10, further comprising interferometrically monitoring the location of the stage along a y-axis substantially orthogonal to the first measurement axis(column 8, lines 40-47).

As to claim 11, wherein the measurement beam reflects from the mirror more than once(column 2, lines 42-48).

As to claim 12, wherein the predetermined information further comprises information characterizing surface variations of the mirror(column 7, lines 41-53).

With regard to claim 17, Kamiya teaches a method, comprising:

determining a correction term related to imperfections in an interferometry system from measurements of first and second degrees of freedom of a measurement object with the interferometry system(column 8, lines 40-47); and

correcting subsequent measurements of a third degree of freedom of the measurement object made using the interferometry system based on the correction term(column 10, lines 37-51). Note that the imperfections in the interferometer are the measurement mirror curving errors.

As to claim 18, wherein the first and second degrees of freedom comprise positions of the measurement object relative to first and second axes of the interferometry system, respectively(column 8, lines 40-47).

As to claim 19, wherein the first axis is substantially parallel to the second axis(column 8, lines 40-47).

As to claim 20, wherein the third degree of freedom comprises a position of the measurement object relative to a third axis substantially parallel to the first and second axes(column 10, lines 37-51).

As to claim 21, wherein the second axis is located between the first and third axes(see the x-axis between the interferometers 26A and 26B).

As to claim 22, wherein the measurement object comprises a plane mirror(column 7, lines 41-53).

As to claim 23, wherein the correction term further comprises information related to surface variations of the plane mirror(column 7, lines 41-53).

As to claim 25, wherein the interferometry system comprises first and second interferometers which during operation monitor the first and second degrees of freedom, wherein the correction term comprises information related to imperfections in the first and second interferometers(column 7, lines 41-53). Note that the imperfections in the interferometer are the measurement mirror curving errors.

As to claim 26, wherein the imperfections comprise bulk imperfections(column 7, lines 41-53). Note that the imperfections in the interferometer are the measurement mirror curving errors.

As to claim 27, wherein the imperfections comprises surface imperfections(column 7, lines 41-53).

With regard to claim 30, Kamiya teaches a method comprising:
scanning a mirror surface relative to a pair of substantially parallel measurement axes of an interferometry system for a plurality of scan paths of different relative positions of the mirror surface along the measurement axes(column 8, lines 40-47);

monitoring locations X_1 and X_2 of the mirror surface relative to the interferometric measurement axes with the interferometry system during the scanning(column 8, lines 40-47);

determining a profile of the mirror surface for each of the scan paths based on the monitored locations(column 7, lines 41-53); and

determining a correction term related to imperfections in the interferometer based on variations between the mirror profiles(column 10, lines 37-51).

As to claim 36, wherein determining the mirror profile for each scan path comprises monitoring an orientation of the mirror surface with respect to the measurement axes during the scanning(column 8, lines 42+).

As to claim 38, wherein the scan paths are substantially orthogonal to the measurement axes(column 8, lines 42+).

As to claim 39, wherein the mirror surface is scanned along one of the scan paths for a plurality of nominal rotation angles with respect to the measurement axes, and a mirror scan profile is determined for each of the nominal rotation angles(column 8, lines 42+).

With regard to claim 44, Kamiya teaches an apparatus comprising:
an interferometer configured to monitor a location, x_1 , of a mirror surface along a first axis(26A); and
an electronic controller(18) coupled to the interferometer, wherein during operation the electronic controller determines a location of the mirror surface along a third axis based on x_1 , a location, x_2 , of the mirror surface along a second axis and a correction term, ψ_3 , calculated from predetermined information comprising information characterizing imperfections in the interferometer.

As to claim 45, further comprising a second interferometer configured to monitor x_2 (26B).

As to claim 46, wherein the correction term, ψ_3 , is calculated from predetermined information comprising information characterizing imperfections in the second interferometer(18).

As to claim 47, wherein the correction term, ψ_3 , is calculated from predetermined information comprising information characterizing imperfections in the mirror surface(18).

As to claim 48, wherein the first axis is substantially parallel to the second measurement axis(see figure 2).

As to claim 49, wherein the third axis is substantially parallel to the first axes and the second axis is located between the first and third axes(see figure 2).

With regard to claim 50, Kamiya teaches a lithography system for use in fabricating integrated circuits on a wafer, the system comprising:

a stage for supporting the wafer(14,W);

an illumination system for imaging spatially patterned radiation onto the wafer(12,PL);

a positioning system for adjusting the position of the stage relative to the imaged radiation(16); and

the apparatus of claim 44(see claim 44 above) for monitoring the position of the wafer relative to the imaged radiation.

With regard to claim 51, Kamiya teaches a lithography system for use in fabricating integrated circuits on a wafer, the system comprising:

a stage for supporting the wafer(14,W); and

an illumination system including a radiation source(12), a mask(R), a positioning system(16), a lens assembly(PL); and

the apparatus of claim 44(see claim 44 above), wherein during operation the source directs radiation through the mask to produce spatially patterned radiation, the positioning system adjusts the position of the mask relative to the radiation from the source, the lens assembly images the spatially patterned radiation onto the wafer, and the apparatus monitors the position of the mask relative to the radiation from the source.

With regard to claim 52, Kamiya teaches a beam writing system for use in fabricating a lithography mask, the system comprising:

- a source providing a write beam to pattern a substrate;
- a stage supporting the substrate(14,W);
- a beam directing assembly for delivering the write beam to the substrate(12,PL);
- a positioning system for positioning the stage and beam directing assembly relative one another(16); and
- the apparatus of claim 44(see claim 44 above) for monitoring the position of the stage relative to the beam directing assembly.

With regard to claim 53, Kamiya teaches a lithography method for use in fabricating integrated circuits on a wafer, the method comprising:

- supporting the wafer on a moveable stage;
- imaging spatially patterned radiation onto the wafer;
- adjusting the position of the stage; and

monitoring the position of the stage using the method of claim 1 (see claim 1 above).

With regard to claim 54, Kamiya teaches a lithography method for use in the fabrication of integrated circuits comprising:

directing input radiation through a mask to produce spatially patterned radiation (column 5, lines 8-13);

positioning the mask relative to the input radiation (column 5, lines 8-13);

monitoring the position of the mask relative to the input radiation using the method of claim 1 (see claim 1 above); and

imaging the spatially patterned radiation onto a wafer.

With regard to claim 55, Kamiya teaches a lithography method for fabricating integrated circuits on a wafer comprising:

positioning a first component of a lithography system relative to a second component of a lithography system to expose the wafer to spatially patterned radiation (column 5, lines 8+); and

monitoring the position of the first component relative to the second component using the method of claim 1 (see claim 1 above).

With regard to claim 56, Kamiya teaches a method for fabricating integrated circuits, the method comprising the lithography method of claim 53 (see claim 53 above).

With regard to claim 57, Kamiya teaches a method for fabricating integrated circuits, the method comprising the lithography method of claim 54(see claim 54 above).

With regard to claim 58, Kamiya teaches a method for fabricating integrated circuits, the method comprising the lithography method of claim 55(see claim 55 above).

With regard to claim 61, Kamiya teaches a method for fabricating a lithography mask, the method comprising:

directing a write beam to a substrate to pattern the substrate(column 5, lines 8-13);

positioning the substrate relative to the write beam(column 5, lines 14-22);
and

monitoring the position of the substrate relative to the write beam using the method of claim 1(see claim 1 above).

The remaining claim limitations found in claims 44-52 are functional limitations and these limitations can be met by the prior art if the structure of the prior art is capable of performing the claimed functions.

2114 [R-1] Apparatus and Article Claims — Functional Language

**APPARATUS CLAIMS MUST BE STRUCTURALLY DISTINGUISHABLE
FROM THE PRIOR ART**

While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d

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1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) (The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference); see also *In re Swinehart*, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971); *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "[A]pparatus claims cover what a device is, not what a device does." *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphasis in original).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-61 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-31 of copending Application No. 10/630,361. Although the conflicting claims are not identical, they are not patentably distinct from each other.

The instant application generates the correction term ψ_3 from predetermined information comprising information characterizing imperfections in the interferometer.

Copending Application No. 10/630,361 generates the correction term ψ_3 from predetermined information characterizing surface variations of the mirror for different spatial frequencies, wherein contributions to the correction term from different spatial frequencies are weighted differently.

The instant application is broader in scope than the claims of the 10/630,361 application and thus cover the same limitations. See claims 12 and 13 of the instant application for imperfections in the interferometer drawn directly to mirror variations and weighting functions.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

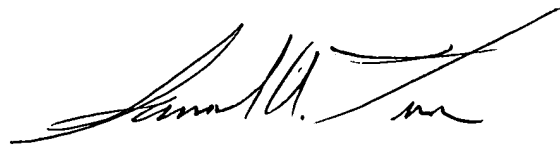
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Turner whose phone number is 571-272-2432.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached on 571-272-2800 ext. 77.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Samuel A. Turner
Primary Examiner
Art Unit 2877